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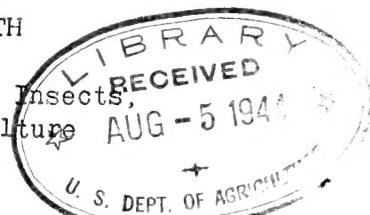
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## AN INEXPENSIVE CONSTANT-TEMPERATURE WATER BATH

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During the course of investigations on the hot-water treatment of narcissus bulbs infested with the bulb eelworm, at the U. S. Entomological Laboratory, Sumner, Wash., an inexpensive and efficient constant-temperature bath was assembled for use in the laboratory for various warm-water treatments of small quantities of materials.

The bath is a circular container 16 inches in diameter and 11 inches deep (a tin shortening tub was used). For insulation it is set in a rectangular box made of "Celotex", supported by pieces of 2 by 2 inch lumber in the corners, and the spaces are packed with sawdust. An instrument board (fig. 1), supporting the agitator, heating elements, thermometer, and thermostat, covers one half of the top, leaving the other half open for the handling of specimens, etc. Two wire baskets which can be hung from the edge are used to suspend flasks or vials in the bath. A circular wire basket,  $6\frac{1}{2}$  inches in diameter, is used when bulbs are treated.

The agitator (fig. 2) is driven by a vertical midget motor of .020 horsepower. This motor is of the shaded pole type, running directly off 110-volt current, and provided with a geared head of 29-to-1 ratio, which reduces its speed of 3,600 to approximately 109 revolutions per minute. A bakelite pulley  $1\frac{1}{2}$  inches in diameter is attached to the reduction gear and another of the same size is placed on the shaft of the agitator. A coil belt, such as used on 16 mm. movie cameras and projectors, is used. The propeller is 6 inches in diameter, with four blades.

The motor was purchased at a cost of \$2.35. This type of agitator is a modification of the original made by C. W. Getzandaner, of the Bureau laboratory at Puyallup, Wash. The arrangement of thermostat and light bulbs, which is described in the following paragraph, is due to the suggestions and advice of Ralph Schopp, of the Sumner laboratory.

A wafer type of current breaker was adapted as a thermostat. To prevent arcing over the points, a 1-microfarad, 400-volt condenser was installed. The water temperature is maintained by electric light globes which are immersed not quite to the socket. One 100-watt lamp will handle temperatures up to  $90^{\circ}$  or  $100^{\circ}$  F., but for higher temperatures a 40-watt lamp is needed in addition.

This arrangement does not have the capacity for raising the temperature of water quickly, but since the volume is small, it is easy to heat the water over a gas burner before putting it in the bath. The arrangement described has maintained temperature within  $\pm 0.15^{\circ}$  C.



Figure 3 shows a top view of the complete assembly. Figure 4 shows the setup as actually used, situated next to a sink where water can easily be added through a hose, or the same hose can be used to siphon the water out of the bath. The safe disposal of nematode-infested water is of great importance, and draining it directly into the sink is the easiest method.

#### Explanation of Illustrations

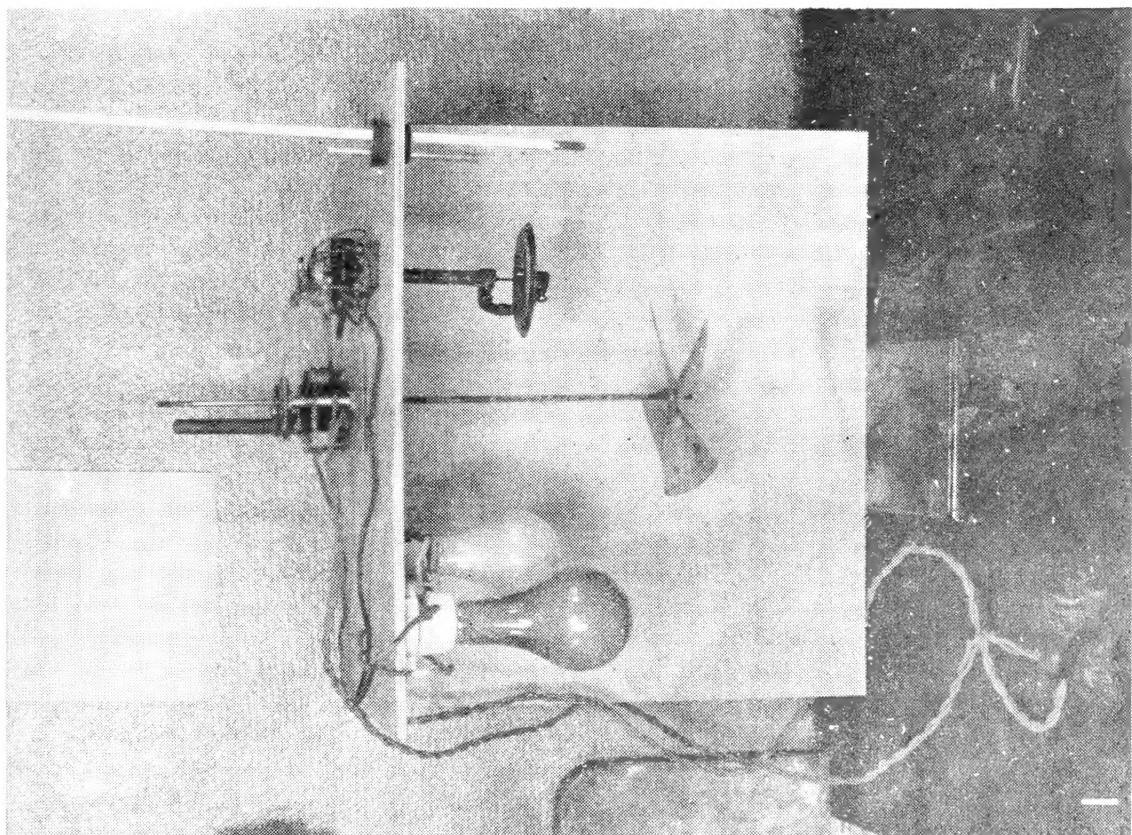
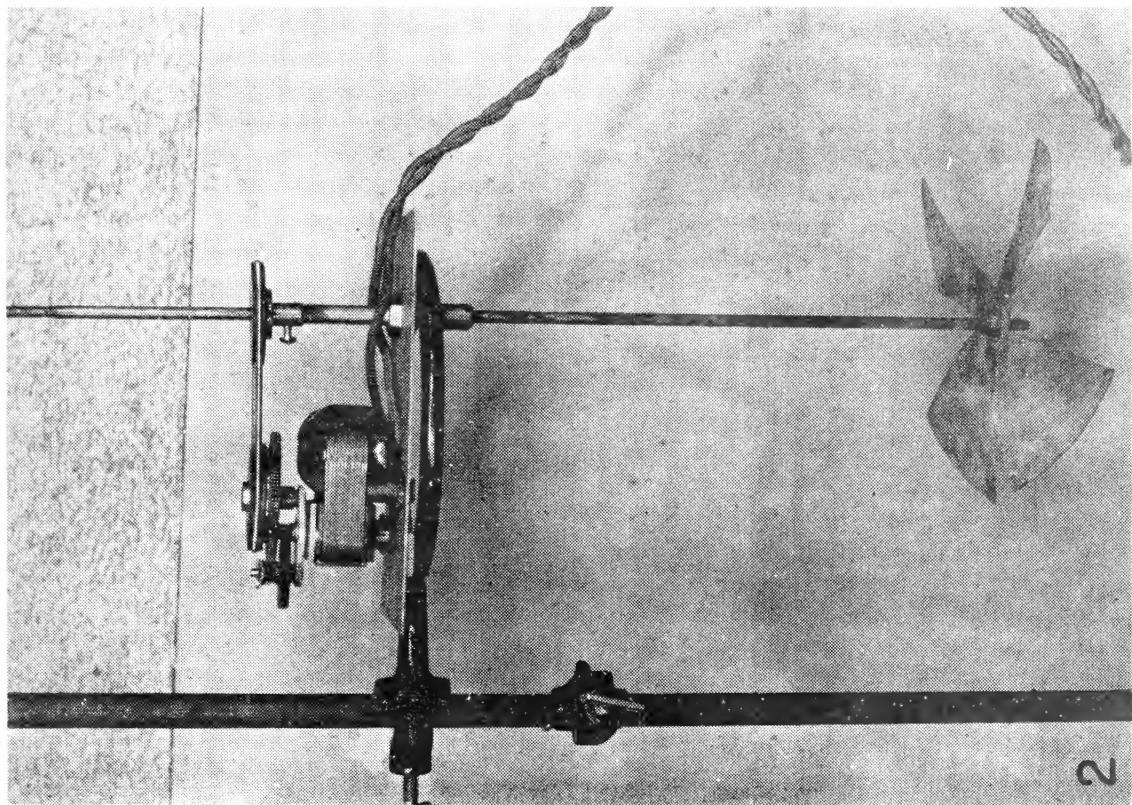
**Figure 1.**--Instrument board, supporting heating elements, agitator, thermostat, and thermometer, which are suspended in the water when the apparatus is in use.

**Figure 2.**--Agitator (adapted from Getzandaner), consisting of a propeller with four 3-inch blades, on a shaft (3/16 inch), driven by a vertical midget motor (.020 horsepower, 110 volt, 60 cycle), mounted on a 3 by 6 inch piece of heavy sheet metal.

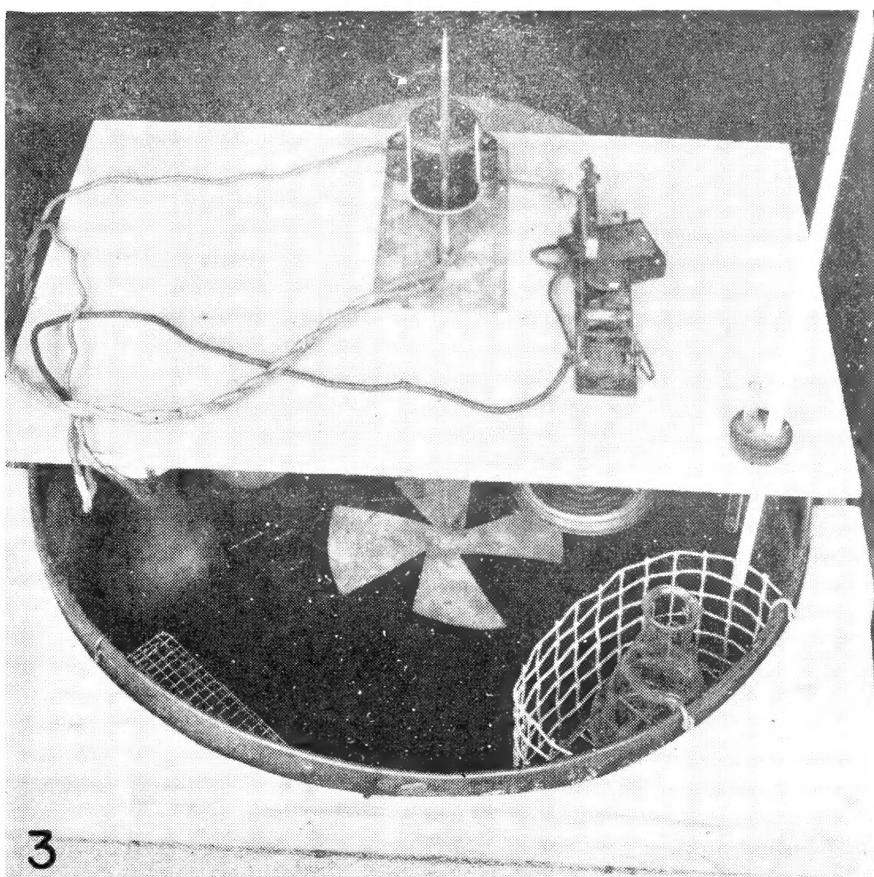
**Figure 3.**--Top view of constant-temperature bath completely assembled.

**Figure 4.**--Constant-temperature bath in operation, showing facilities for filling and draining.

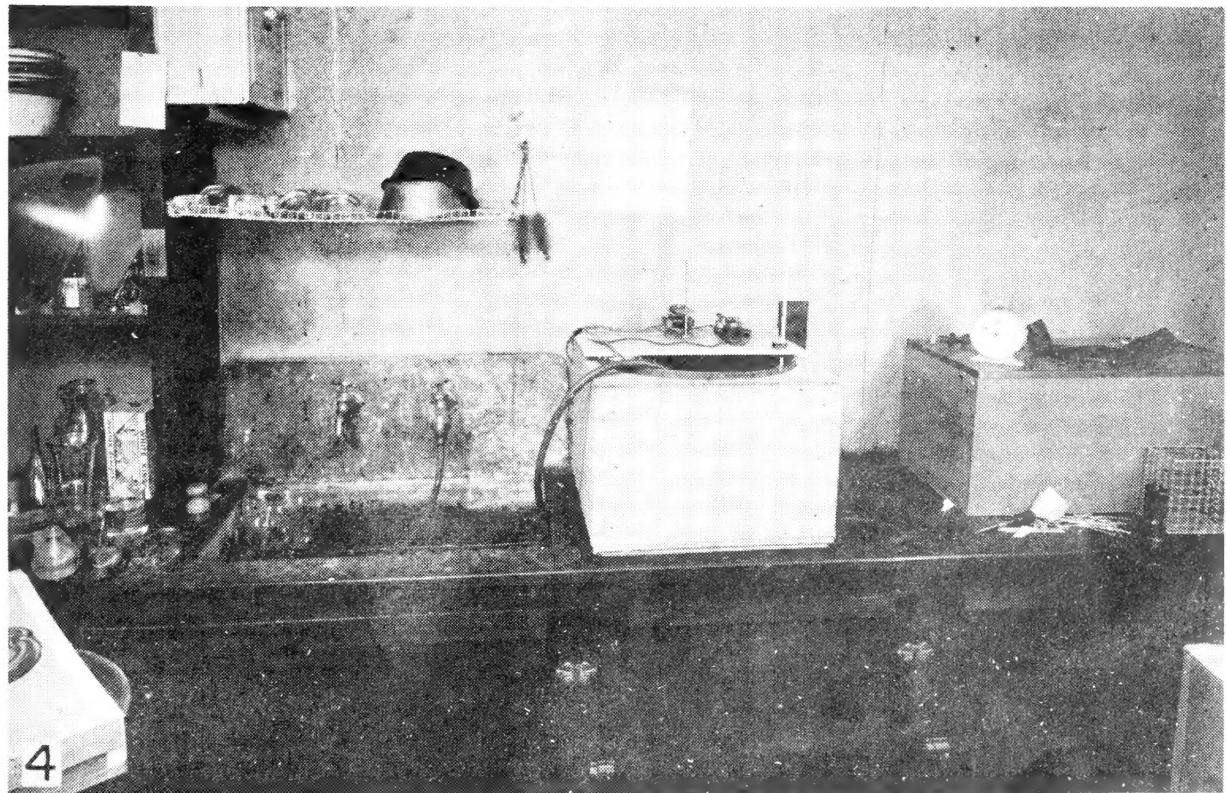
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